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Synchronous Teleaudiology, presented in partnership with AVAA

Presenter: Darrin Worthington, AuD; Chad Gladden, AuD, CCC-A; Rachel Tomasek, AuD, CCC-A

- [Host] It's my pleasure to introduce to you today's presenters. This course is brought to you in part and in series by the Association of VA Audiologists annually. Audiology Online host courses with AVAA on a quarterly basis. And we're so delighted to have our second presentation here with you. Today, we have Dr. Worthington, as well as Dr. Gladden and Dr. Rachel Tomasek. I'll go ahead and hand the mic over to you, Dr. Worthington, to go ahead and get started. Thank you.

- Thank you very much. Just to go over a few different disclosures here too, these are actually our disclosures overall. One thing that I do wanna point out, you can read through these at your own leisure there too, but one thing I do wanna point out is that any of the views expressed here are really, really the views of the presenters, and do not necessarily reflect the opinions or views of the United States Department of Veterans Affairs, or the United States government as well too. For learning outcomes, so after this course, participants will be able to describe the history of teleaudiology adoption and use within the VA, identify potential barriers to future telehealth integration, describe the basic steps of a teleaudiology patient encounter within the VA.

So I'm gonna start. My name is Dr. Darrin Worthington, and I'm gonna be discussing a history of telehealth. But first, let's do some polls. So we're gonna see a poll pop up on our screen here. So for the recorded version, I will also be reading through these. But if you could take the time to answer this. So for our first question, it is, what do you think of when you first hear the word telehealth? And the answer or the choices, possible choices are televisions, technology and stuff, never heard of it, or I think of the transfer of medical information via telecommunications for consulting, remote procedures or exams. I wonder which one it could possibly be. So I'll give you a few time, some time there to answer, and then we will review those results too.

Good. And so again, you know, what do you first think of when you hear of the word telehealth? 96% of you actually said the transfer of medical information via telecommunication technology. 1% answered technology and stuff. I do appreciate that one too. But you're right, it is the transfer of medical information via telecommunication for remote procedures, that kind of thing too, which we're going to talk about a little bit too. So we're gonna see a little bit more polls coming up here. And just some yes or no polls in terms of answering these. So there are multiple polls on this one. You will need to scroll down to see all of them. I am gonna read through them as you're answering them just for the recorded version of this test too.

So it's number one. Did you personally have a virtual medical appointment prior to the COVID pandemic? Either yes or no for that one. For number two, have you personally had a virtual medical appointment since the pandemic? So yes or no for this one. For number three, did you perform telehealth with your patients prior to the pandemic? Single choice for yes or no. Number four is did you perform telehealth with your patients during the pandemic, yes or no? And do you perform telehealth, then question five, do you perform telehealth with your patients currently? And the answer possible answers are yes or no on that one. So I think these are some really interesting questions just to kind of gauge exactly where people are, and where people maybe have started their journey into telehealth overall.

I will tell you, I've been presenting on telehealth for a very long time. At one time, this was a kind of novel idea. Nobody had really heard of telehealth, or integrating telehealth, or had heard very little about telehealth overall. So I'd like to ask these questions just to see the progression of this. We also ask this when I present to students at various universities on this too. And to see it over the years as actually, you know, students having very little to do with telehealth, and now it's integrated in a lot of their coursework as well too. So we will see the results here and we can talk about it. So in terms of the first one, it was always really interesting for me to see, you know, if

you personally had a medical appointment prior to COVID that was a virtual medical appointment overall.

And what we're seeing here is that 73% of you had actually said, no, I've never had a medical appointment prior to COVID. That tracks. I'm gonna say it was less than 20% if you look at the actual data, raw data and numbers overall in terms of people having any kind of virtual care appointment prior to the pandemic. Since the pandemic, have you personally had a virtual care appointment? Overwhelming majority, everything is pretty much flipped. 70% has said yes, we have had a virtual medical appointment, you know, since that pandemic. In terms of going into actual teleaudiology practice or any of the other practices was seen using telehealth with your patients, have you used telehealth with your patients prior to the pandemic?

Even higher percentage, 89% of those respondents here had said no, I had not used teleaudiology with my patients. The real interesting one is going to be the next one. Did you perform telehealth with your patients during the pandemic? So we do see a slight increase, 41% saying, of the respondents here saying yes, absolutely, we've used telehealth with our patients, but still 59% saying no, we haven't. So what that tells me is that, you know, is audiology maybe not as adoptive or as adaptable to telehealth services overall? I would say no. Or has it just not, you know, trickled down to audiology in general too? So we would expect to see potentially a higher percentage with that too. And then the last one here for this one, do you currently perform telehealth with your patients?

And still we see a low respondents of yes at 35% of those respondents saying yes, with 65% of those people respondents saying no, we don't currently perform telehealth services overall. So interestingly enough, maybe we can get you guys into using more telehealth with your patients, or at least some aspects of telehealth and virtual care with your patients from this presentation overall. And I think there one is one, is that, I

believe that's all, yes. Okay. Thank you for entertaining me there. So let's start off with just a brief definition of exactly what is telehealth. I like to talk about what is telehealth, and in particular, you know, telehealth is a transfer of medical information via telecommunication technologies for consulting, remote procedures or exams.

When we look at telehealth and telehealth services too, I also really like to talk about what it's not, because as much as I love telehealth, I love the integration of virtual care into healthcare as well too, it really is not a separate subspecialty. I mean, if you really think about it, we're performing the same procedures just over distance, sometimes time, and we're using some form of technology overall to do it. So really, we're doing the same things that we would do with patients in-house, just doing it virtually with some modifications as well. So it's really just us providing care using technology. So let's talk about the history of telehealth. Well, who was the first? Well, that's kind of a matter of opinion at this point.

So if you look back in history, we actually can go all the way back to the Civil War era in 1865, where some people feel that this was actually the first use of telehealth or technology into healthcare. And what they were actually doing is they were using a telegraph wire between a hot air balloon that would relay information from the battlefield back to the surgeons in the rear. So if you could envision a giant hot air balloon on a battlefield with a long wire hanging back from it, going back, you know, thousands of feet, miles to the surgeons in the back, and they would actually, with the forward observers, be looking through binoculars, seeing what kind of casualties or what kind of injuries might be coming back for those surgeons to kind of be expected for them to be able to treat in battle, from the battle wounds overall.

So that some people think that this was really the first integration of technology into some healthcare as well. But if we take a jump forward there into 1906, some people think that the first true form of telehealth was when the first EEG information was

transmitted via that telegraph wire. So if we take a look at 1906, we can actually see, you know, we're using what current new technologies, and again, telegraph was fairly new, or some of the newer technologies of this time, in transmitting that EEG information, so that it can be read and interpreted overall by a provider at a distance portion. We can actually fast forward a little bit too to 1924 in the "Radio News" magazine. They predicted something called the radio doctor.

You can actually Google this and take a look, if you would Google radio doctor or "Radio News" magazine. What this actual image shows is a television set with all the peripherals you would think that you would need, you know, stethoscope, otoscope, other cameras, a light source, and then you could see a patient sitting on their bed, and they are being evaluated from a remote doctor, while their parents are sitting on this bed with them as well too. Now, the reason that this is interesting is in 1924, televisions were not very mainstream at this point. The first true electronic television came out about two years later, and it wasn't widely disseminated to that point. So in order for us to look at, I mean, even before the technology was there and in place in everybody's house, they were actually looking at how we can integrate possible technology into healthcare.

So that's definitely one you should Google. Let's fast forward to 1959 and some interesting uses. And actually we're gonna bring in some VA telehealth look here too in terms of the history. So in 1959, the University of Nebraska Medical Center actually set up two-way television communication with mental health groups, actually, that were located at various VA locations throughout that area. So they set up a mental health hub with the Omaha VA, the Lincoln VA, and the Grand Island VA. And this was mainly for group, again, for group mental health therapy sessions. This is an actual picture from one of those groups. So what you can actually see here is that the remote provider at the University of Nebraska Medical Center is actually on a fairly large television screen there.

There's a microphone in the center of the desk, so that the remote provider can actually hear all of the people and their comments. There's also a video camera, if you can see it right on top of there. I don't have a provider side view of this, but I imagine that the screens would've been small as well too. So this was actually used and set up between the University of Nebraska Medical Center and multiple VAs in that area. But most people would agree that if you really look at what we consider to be modern telehealth, the father of modern telehealth is Dr. Kenneth Bird. And Dr. Kenneth Bird was a physician at Massachusetts General Hospital, and that's in Boston.

And so in 1968, he was tasked with figuring out how we can provide care to people that were landing at Logan Airport that might need emergency care, that might need care with, you know, other facilities or other consultation of care overall. So if you're not familiar with the Boston area, 'cause I was definitely not as familiar with this until I started researching this, Mass General Hospital you can see is over here to the left, and it's only about three miles to actually get to the airport. However, during heavy times of traffic or, you know, whenever there's a lot of traffic or a lot of people traveling at once, it can take upwards of an hour or two to actually just go those three miles to get into the airport.

So instead of having emergency services, and if they needed an emergency consultation, that's what Dr. Bird was trying to help eliminate that need or that distance factor for it. So he was able to provide occupational and emergency consultations to the medical staff that were on staff at that airport. He did use TV studio equipment for the two-way communication between those staff and himself at the hospital. And he really saw a lot of patients. He saw over 1000 patients over a two year period from 1968 to 1970. One thing that I really want to keep in mind here is we're talking 1968, right? So we're talking, what kind of technologies would we be working with at this time? So what you can see here is actual photos from Dr.

Bird and the situation from the setup that he had. He actually got a lot of national press coverage for this, and there is a lot of information about his program starting up, 'cause it was pretty revolutionary at the time overall. So what you can see here on the right hand side is Dr. Bird himself. This is basically a TV studio setup that they had built at the hospital overall. You can see he has a few different screens here that he could see if there was multiple cameras overall. He had an earpiece that he would be able to hear the people at the airport, anything like that. They would hear them through his microphone. He had some controls for volume, and anything else that he might need there overall.

I don't believe they were able to see him at the time, but they were able to hear him. The interesting thing is that on the opposite side, what you're seeing here is you're seeing the staff that was on the airport side of things that were actually running the camera, helping with the patients overall, and then answering any questions they might have. So really like the hands for Dr. Bird at that time. Just of note too, just while we're mentioning Mass General Hospital too, Mass General Hospital actually established a telepsychiatry link to the Bedford Massachusetts VA hospital also at around the same time in 1968. And this link, similar to the one that was happening at the University of Nebraska, was operational until the mid 1980s.

When we look at Dr. Bird's program, I just really wanna talk about what maybe were the limitations of Dr. Bird's program. One that's blaringly obvious is technology. I mean, again, we're talking 1968. So at that time, the cutting edge technology for transmission were microwave or satellite transmissions. We didn't have any internet at this time. You know, internet came in the late 80s, early 90s in terms of actually being of an idea or anything. So, no internet connectivity, like we think of it as of today. You know, it was also very expensive. So this TV equipment was actually not cheap at the time. And in

fact, it could cost upwards of 10s to 20 thousands of dollars, which for the 1968 is a considerable amount of money.

So for him to be able to get funding and to actually push this out for those patients was pretty incredible for the time. We also looked to Dr. Bird's program, and we all look at it as why is this important? Well, realistically this was super important because ultimately what this able to do was that it inspired other programs to actually start, one of which was NASA. NASA basically photocopied exactly what Dr. Bird was doing, and then also use this in monitoring astronauts that were in space as well too. And again, he was showing that this was truly feasible, that this type of healthcare modality was truly capable. You could actually do this, even given the technology of the time.

Unfortunately, if you look through the history and through the literature, not much was done with telehealth outside of NASA until really the 1990s overall. And what happened in 1990s, in the 1990s was a group of politicians were really looking at how they could provide healthcare to some of their more rural or tribal constituents overall. And so this was in the Western states, through the Western Governors Association. And they were specifically looking at how can we provide healthcare to our Native American constituents living in remote areas? And you know, for the betterment of tribal health overall. And so if you're not familiar with some of the Western states overall, they have large distances where we do have indigenous people that are living at this distances apart, and it's very difficult for them to even get into a local clinic, let alone a full fledged hospital.

So these governors actually were meeting about it and looking at what we could do. Also, they were interested in not only the tribal health aspect, but they were also interested in how they might leverage telehealth and implementing telehealth into the correctional systems or jails. Ironically enough, correctional systems and jails were the early adopters of telehealth modalities. And really, what it comes down to is money and

personnel. So if you can envision transporting an inmate from a prison to a clinic, and what that might entail overall. So really it can take, number one, it's gonna take multiple people and different resources. So you could potentially have up to 10 people in terms of guards, in terms of other chaperones, and you could potentially have up to three vehicles.

If you think about it, you're gonna have to have where the prisoner's being transferred, and potentially some police officer escorts and that kinda stuff. And also, this is just for one inmate to follow up for a follow up type of appointment or a 15 minute appointment. Also, not all jails or correctional facilities actually had staff that were willing to come in or come in to evaluate and treat patients at the actual physical site too. So telehealth was a really good way to implement this, and a cost effective way to implement patient care while they're, for incarcerated individuals. But really the first time that we see in the literature about earmarking money on a government level for telehealth services was in 1996, and that's when Arizona was the first state to actually earmark \$1.

2 million for telehealth services. And they were really looking at community health centers, prisons, jails, other correctional facilities. Very, very rural hospitals where they might not have specialty care providers and they would need some direction from specialty providers that were offsite, or at another site. Rural schools. You know, obviously the Native American healthcare that we talked about. Other distance learning affiliates that they had in there. Also some international sites, and urban hospitals as well. Now, if you look at Arizona, since 1996, they still have this telehealth hub in place, and it's actually the oldest and one of the largest and most robust in the United States, outside of the Department of Veterans Affairs. So they have now over 150 telehealth sites that are statewide, with the hub-and-spoke model.

Hub meaning the main facility where the providers or other staff could be, and the spoke site is where the services are provided. So pretty vast and big system, and pretty ahead of its time in 1996. So you might be thinking, well, this is all great, this is all wonderful, so why are you telling me this? Well what I'm trying to hit home here is that, you know, I think people have been integrating technology into healthcare for a long time. I think no matter what technology is coming from, what you're looking at, that technology at that time, I think someone has been forward thinking enough to actually look at it and say, "Hey, how can we integrate this to benefit our patients?"

" How can we integrate this to actually, for the betterment of our patients as well too? So I don't think this is a new idea by any means. I think the technology that we're currently using could be new and novel, but I think this is a very old idea as we're trying to provide care to our patients. We're gonna go over just some of what we consider to be the telehealth modalities. So in terms of the three different sections that we typically break telehealth into, we're actually gonna be talking about clinical video telehealth, also known as synchronous telehealth. We're gonna talk about store and forward telehealth, also what we consider to be asynchronous telehealth. And then we'll also talk about a unique program that we have in the VA and other sites do as well that we call Remote Patient Monitoring Home Telehealth as well.

So the first one is clinical video telehealth or synchronous telehealth. And so this is really that real time synchronous audio and video transmission. And so what you're actually going to be seeing is very similar to Dr. Bird's program overall. You're going to have a patient at a site with medical staff on site. In this case, we're talking about a main VA medical center to one of our satellite or community-based outpatient clinics, where that patient will come into the clinic. There would be some technology with a camera and a cart, and some medical personnel, we call them telehealth clinical technicians or TCTs, who can be the eyes, ears, hands of the provider that's remote there too.

And so this uses the telepresenter and exam peripherals, which would be on the patient side of the cart, so for full evaluation. The really interesting thing I think about clinical video telehealth is it's into a satellite office, is that it's a real partnership with the staff that are on that site. So you're working as a team. And you know, you can be doing a lot of different things with a team approach in terms of healthcare. This is definitely, you know, via synchronous video there as we talked about as well too. So examples of this, teleprimary care, also obviously teleaudiology. So the patient would come into one of our community-based outpatient clinics. We could do a full evaluation on them, treat them and then go from there.

I had some patients when I was seeing, when I was still actively seeing patients through VA that I had never met in person actually, so through our clinical video telehealth. So for our asynchronous modality where our store and forward telehealth overall, again this is asynchronous, and this is taking clinical information, like we're taking data, images, sound, or even a video, any kind of clinical information, we're going to store that somewhere on a secure server, or a secure area or secure computer that we can then forward or alert another clinician at a site for evaluation, and this usually involves at another time. So literally we're taking that image, we're taking that video, we're taking those whatever, storing it and then a provider's gonna log into a different system and take a look at that, make recommendations for healthcare and direction based on that too.

One of the most common ones I think of when we think of storing forward telehealth is that we think of any of our teleradiologies. 'Cause if you think about it, you're taking an image of the patient, you know, they're coming into a site, getting imaged, and then they are storing those for being read at a later time and date overall. Some other examples of this are teledermatology. So for example, you can take a picture of a wound, or you can take a picture of a rash, store that. A provider can log in and take a

look at it as well too. We also have telesleep medicine. So, if you look at this in terms of our asynchronous modality, a patient would have a sleep apnea device or home sleep apnea test device that they would actually sleep with.

That information is then uploaded to a remote server, a remote secure server, and then is read at a later date by a provider at a different site overall. In audiology, we also do this. We can do it with automated hearing tests where we're storing that information, and then an audiologist is retrieving that, looking at it, and then also taking action based upon those results overall. I think a lot of these, with the store and forward modality in particular, they do require the use of an imager, and that first image there, that's for our teleretinal imaging. So a patient will come into a site, and then one of our telehealth clinical technicians who is trained to do all of these kinds of wonderful tasks, would take those images and then store them on that remote server, and alert the provider to read them as well too.

And lastly, here I do wanna talk about Remote Patient Monitoring Home Telehealth, or our RPM-HT program, which this is really a unique program, and actually the oldest program, the oldest telehealth program in VA is technically our Remote Patient Monitoring Home Telehealth program. And so what this really does is this uses in-home devices and other technologies to monitor a patient's chronic illnesses, their symptoms and vitals overall. So really this is more geared towards chronic illnesses and monitoring symptoms and vitals, so that we can, number one, monitor the patient remotely, but also so that we can educate the patient, so that they can take control of their own chronic condition and illness. So we're educating that patient, and really trying to get them to take ownership of that as well too.

While they're enrolled in the program, these are monitored by care coordinators, which these are all nurses who have been trained to do this, and can read all the results and everything else that the patient is responding with, and then entering in with all their

different information, and then making actions on them. They get alerted that there's something that's out of whack that they need to actually intervene with as well too. So it's a pretty unique system in terms of trying to give that patient some independence, but also still having that fallback of, yes, there's somebody who's going to be helping me along the way. Remote Patient Monitoring use something that they call disease management protocols. And again, these are scripted responses that are sent to the patient daily.

You can see in that first picture there, there is actually a patient that's responding by taking their blood pressure. And that might be for a hypertension disease management protocol, where they're trying to learn how to actually manage their chronic condition overall. And that's really the whole hope of Remote Patient Monitoring Home Telehealth is eventually that they're hoping that those patients can really independently manage their chronic conditions, and feel confident in doing so with that education that's been provided. So you might be thinking too, well, this is all good and wonderful, but why are you guys doing telehealth in the VA as well? You're the largest healthcare system in the United States, so why are you guys interested in doing telehealth?

You have locations everywhere. Well, if you actually look at our veteran population in the United States, we have approximately 18.5 million veterans that are living within the United States, and that's as of last fiscal year. So if you actually look at how many of those veterans are registered with us, there's just slightly over 9.6 million veterans that were registered with VA in FY24. That's anticipated to be much higher, well, over 10 million in FY20, this fiscal year. If you really narrow down onto the 9.6 million veterans that are registered with VA, and also look at those 18.5 million veterans where they're actually physically located, you'll find that about 33% of registered veterans and 43% of all veterans live in rural or highly rural areas.

So that's a large population. That can present a lot of different issues for actually trying to get those patients adequate healthcare, especially specialty health, specialty services healthcare as well too. You have limited access to VA care, even if there's a local VA CBOC or location next to you or close to you. There might not be one for the nearest hours. And then within our integrated service network for our area here in the Chicagoland area, we have actually with our Iron Mountain, Michigan VA site is the most rural town in America. And so for some patients to be able to get to the closest CBOC, or community-based outpatient clinic, or satellite office, that can take upwards of a three hour drive.

So how can we provide that care to those veterans overall? And then again, what we had talked about was the outpatient clinics might not necessarily have all the specialty care clinics that patients are looking for. If you look at our overall telehealth data from fiscal year '23, so that ended in October of '23, you'll find that VHA is and has continued to be the largest telehealth provider in the United States. We racked up over 11.7 million episodes of care. Now, when we talk about episodes of care, that includes all the different modalities that we talked about, clinical video telehealth, store and forward telehealth, and then also our Remote Patient Monitoring Home Telehealth encounters too. So 11.7 million episodes of care.

9.3 million video visits were done into the home using our home baked to VA Video Connect, which is our platform, kind of like FaceTime, but a much more secure version of FaceTime for our patients and providers to meet up, and groups to meet up as well too. And in FY23, we were able to actually serve over 2.32 million veterans with telehealth, so individual unique patients. One thing I did want to talk about too that I think is interesting, and it's not necessarily within the scope of this is that, you know, we all hear about this digital divide, and if you're not familiar, a digital divide is the separation between technology, connectivity, and people being able to afford it, or you actually have access to that as well too.

So there is a digital divide if you look through the literature. VA has addressed this, and VA was cognizant of this going into expanding telehealth services. So what we can actually do in VA is any provider that sees a patient that thinks a patient could benefit from telehealth services can actually enter in a digital divide consult request. Whereas this is reviewed by a social worker or a team of social workers, and then the patient can be mailed and loaned a cellular enabled iPad for them to use for their telehealth experiences. So if that digital divide is affecting our patients, then they would be able to use a VA loaned iPad for the duration of their treatment that they would need.

What happens after their treatment is done is that they get sent a box, they get shipped back to our Denver acquisitions and logistics centers, that iPad gets wiped, gets reinstalled with all the software and program everything, get disinfected, and then it's sent out to another veteran to be used. And so since 2017, as in the end of fiscal year '23, we had sent out almost 190 of these iPads that were being loaned out to patients overall. So pretty unique kind of situation. There's also with the gapping that digital divide in VHA, there's what they call a zero rating on data for all the major carriers of cellular data within the United States. So any of the big three, we're talking Verizon, T-Mobile, and Verizon, T-Mobile and Sprint, or AT&T, I'm sorry, any of those, the actual data usage from the patient, if they're using a VA Video Connect appointment is zero.

So it doesn't count against their data cap, should they have one. So VA is very cognizant about trying to remove barriers for care for our patients with the digital divide too. Also, we had talked a little bit just about the growth and the history of telehealth. So really, we look at it as telehealth starting in 2003 in the VA, even though I had shared with you some instances where it actually started quite earlier than that. But our first official formal telehealth program was our home telehealth in 2003. So you can actually see through the years, we added in some of our clinic-based telehealth, which is when audiology really got involved in around 2008 actually. Some inpatient telehealth

and our Community Living Center telehealth kind of things, expanding to Clinical Resource Hubs, and then also our VA Video Connect.

And then obviously in 2020, we had our pandemic, which really pushed telehealth services through. So we had long established programs, and we were uniquely positioned I think to handle converting over to a virtual one. So we've been over, it's actually 21 years now in terms of official VA telehealth. One thing I do like to look at is I like to look at the data, and so I like to look at exactly what we're doing, how we're growing, if we're sustaining. And you know, we talk about telehealth services too, but how many are we actually doing? So if you look at, this is just basic encounter data, so this is actual appointment data in individual appointments, and this is done by fiscal year for the VA for all of our different modalities, clinical video telehealth, store and forward telehealth, and our video into the home.

And this is for the US Department of Veterans Affairs nationwide. From FY16, you can see where we were doing a considerable amount even at that time, 1.15 million encounters in fiscal year '17. You can see as we go along, we have steady increases, steady growth over time. So we're increasing the use of it. So patients and providers, most finding this beneficial. Now, take a look between FY19 and FY20, obviously we know what was happening during this time. You know, we had a global pandemic that was starting to kick in. A lot of us were under, you know, stay at home orders, that kind of thing. People were not wanting to come into this. We were still wanting to provide care to our patients and how do we do that?

Telehealth services were definitely the leader here. So you see the large jump up and increase in care that we were doing with our patients into the home. And then from FY20 to actually FY21, you see an even bigger increase. I think the real question was when we were sitting, you know, at the end of FY20, FY21, we're like, is this gonna sustain? Are levels gonna drop back off when we come back down in from when this

public health emergency or pandemic is actually officially ended overall? And I think what you're seeing with these numbers here from FY21 to 22, we see a slight dip, and we're like, okay then, maybe this was the dip that was actually coming, that we're gonna expect it to fall off to like pre-pandemic levels.

However, from our FY23 data, you can actually see that we're not only sustaining, we're actually growing. So, VA, so in VHA at least, and this is actually reflected in the data that is actually in the private sector as well, you're going to see that there is growth in sustainment of telehealth services. Patients like it, they're benefiting it, they're getting the same quality of care that they would if it was in a face-to-face appointment as well too. Obviously we can't do everything via telehealth, but a lot of things we can. And so I think this is gonna be just a real another tool belt, or a tool in our tool belt going forward. And I am going to hand it on over to Dr.

Chad Gladden.

- All right, Darrin, well, thank you for that. Yeah, so my name is Chad Gladden. I'm the audiology telehealth coordinator for the Audiology and Speech Pathology Program Office. So I do have at least the privilege of being able to work with some great engaging clinicians. And I also interface between the Office of Connected Care, Office of Rural Health, rehab and prosthetic services on some of the other technical pieces. So I have been with the VA, or at least doing telehealth since about 2008, when I was actually in the clinic itself, and then I've been with the program office since about 2012, so. But you know, to kind of Darrin's point too, I think this is a slide that I had pulled up or I found interesting, and this was some work that was done with Gartner and Kaiser Permanente, and this dates back to like 2017.

And kind of looking at the direction of just where healthcare was kind of going. But this was very well called as far as kind of looking at where we were trending, where we

were kind of going itself. Clearly, you know, these were projections that came before at least the pandemic and have held true, and very much a part of kind of the direction that the VA's kind of been going itself. So just a little bit of some kind of more recent history. I just think, you know, this was interesting as we were kind of looking at the direction of where, you know, at least the healthcare industry was going. And then, you know, we're kind of slammed with, you know, at least the pandemic itself that really kind of accelerated that growth into where we see things today.

In the VA, we've been very fortunate, I know from at least dating back to 2018 was kind of our most recent, or at least a six year strategic plan itself. And virtual care back at least at the time was, you know, a large focus for us. I mean, it was for rural and underserved areas as well as serving veterans in different areas itself. The VA was very fortunate, or at least audiology was, where we were actually kind of singled out. So telerehabilitation, audiology and speech were kind of looked at some emerging areas and kind of looked at and really to the forefront. So a lot of work that had started prior to that. But it gave us some additional momentum and focus as we look to kind of move ahead, so.

One of the things that came, and this is a little bit of a difference for us at least in the VA is that in 2017, we were authorized, at least with the Anywhere To Anywhere telehealth initiative as part of the VA MISSION Act. And this did allow or authorized VA employees or healthcare professionals to provide telehealth to veterans at any location, any state, regardless of where that veteran or healthcare professional was actually stating. So this could be done over, you know, state lines. And also offering services off of kind of the VA brick and mortar itself, services into the home, other locations outside of. And so this was really a changer, at least for the VA. A little bit different than maybe some of the stipulations or requirements for folks that are in the private sector itself.

But it really did open up the opportunities and the type of care that was offered to our veterans in a variety of different scenarios. So within at least some of our healthcare priorities, there's a variety of different goals, and you know, it's kind of three buckets that are really kind of critical, and that's our access, it's virtual care, it's the technological development, and incorporating that. And so if you kind of look at some of the goals that the VA does hold as far as connecting veterans to the soonest and best care, this kind of whole health mission that we are currently on, the caregivers, survivors, looking at treating veterans with military environmental noise exposures. All of those do have at least a virtual care component, or have primed themselves to very serving, or being served very well with some of the technological advances that have been occurring, both, you know, within and outside the VA, and how that's being adopted.

So at least with the teleaudiology pilot, kind of where we started, and like I said, I've been doing at least some of the teleaudiology work since about 2008. That is about the same time that we nationally had kind of looked at some of the preliminary planning stages, to look and see really where could we go with telehealth or teleaudiology itself. And for at least the VA, it started off with a national pilot. There was a proof of concept, and we wanted to look at a phased approach as far as kind of looking at what services were available. But we looked at initial hearing aid fittings, subsequent and aftercare appointments, and then looking a little bit further into doing some remote diagnostics.

And that was really something that was kicked off, it was a partnership with telehealth services, the program office and some other groups itself. And that kind of set forward or was started moving forward after a couple of years of planning and some initial testing in fiscal year 11. At about the same time, and this is a little bit later, but there was a VA industry competition where we were soliciting requests from the private sector to really to kind of take a look at what was the state of the state, as it related to new and emerging technologies, and what could we take forward. And there was an

award for two pilots. One was looking at automated hearing testing, and using that in a variety of different scenarios, that being in a home-based type of an environment, and also in CVT or at least that realtime synchronous, as well an asynchronous method.

We were also looking into some of the initial capabilities for some of the remote programming applications itself. So these two year pilots kind of evolved, but they kicked off in 2014, and have kind of taken on multiple stages, and that technology has advanced to the point where, you know, we're using it day in and day out now as that kind of currently has move forward. In 2017, there was also part of it was the Office of Rural Health, where we were at least sponsored, or provided some stimulus or grant funding to look at primarily hardware opportunities from national kind of clinical configurations or equipment that was there. But that was in 2017 where we were making some of that available to sites itself.

And so that was across VA, there were certain criteria as it related to some of the rurality of those given locations itself. But we're able to kind of, to put some seed money into moving that forward. That pilot, or at least that enterprise wide initiative is kind of coming to a close, but it has been a really a wonderful run over the course of the last seven years to really kind of to provide some additional hardware and some personnel support to the field. And really where we see ourselves right now is kind of looking at kind of changing the form factors, the overall footprint, as far as some of our equipment options itself, and expanding our portfolio of services.

And I know that Dr. Tomasek is going to discuss this a little bit too, but there really isn't anything that we do within the realm of audiology that can't be done at least in some type of a virtual capacity, and you'll see that a little bit more with kind of our expanded portfolio. So as a part of the pilot that started in 2011, we had gotten, or we started off with 10 pilot sites nationally. And so they were picked due to a variety of different reasons. It was either the staffing, the partnership, the rurality of those locations. But

we moved or we started off with 10 locations, at least with that formal pilot. And in 2015, that moved to 71 locations nationally.

And again, we were kind of looking at expanding what we were originally doing with the remote programming of hearing aids, and then taking it a step further and looking at remote diagnostics. And so they were doing this in an open room type of an environment off of what we've got at least listed, and that's one of the telemedicine carts. So it is a primary care cart. It's a multidisciplinary kind of tool that's there where we've outfitted or at least placed some audiology peripherals that we're on to be able to do that. There was development that was done at least as far as integrating a sound level meter to ensure that we're meeting at least permissible noise standards, at least in that type of an environment as well.

And then for certain locations that just could not meet some of the ANSI requirements, looking at, you know, what were some of our kind of remote telepresence experiences, or using some type of an enclosure that was outfitted to support that. And again, the majority of these endpoints were at a, you know, clinic based outpatient clinic or one of our satellite clinics, with the majority of the services being provided from an audiologist that was at the main medical center itself. And this just gives you a little bit of a breakdown as far as what we've got right now on at least the telehealth encounters, and this just goes back to FY20. But it gives you a breakdown as far as VVC or that's our VA Video Connect.

And again, that's more or less providing synchronous realtime services to a veteran in their home environment. CVT or clinical video telehealth, which I'll kind of go through a little bit more, but that's kind of, we're working at least with our onsite hands with a telehealth clinical technician. So it could be somebody that's supporting. It could be an LPN, an RN. Sometimes it's a dedicated audiology health technician or an assistant that's trained to serve at least in that capacity. And then also just kind of gives you a

little bit of a breakdown too on kind of an area that really is starting to take off for us, and that's our asynchronous, or our store and forward telehealth work.

But just in FY23 alone, we were close at least to 90,000 encounters. There was a little bit of some kind of leveling or planing, but we do anticipate to see some continual growth or increase with that. And really, I mean, for as impressive as, you know, at least the workload that we are currently doing for teleaudiology and the vast portfolio, we still really haven't even scratched the surface as far as what we're capable, or where we're gonna continue to move. And this just gives you a little bit of some background too. I mean, the largest modality, at least for the audiology pieces is this synchronous clinic to clinic, or generally it's providing services to, at least from a main medical center to a CBOC.

It could be from, you know, a community based outpatient clinic or a satellite clinic to another satellite clinic. In a lot of circumstances, we're seeing more where this is not just an intra-facility type of an effort, but we're supporting other medical centers. So you know, like a site like Iron Mountain, for instance, can be supported from either Milwaukee or Madison, or from at least the Chicago area itself. And that's one of the beautiful things that we do have where we're not bound by some of the state licensure requirements, and at least just the overall approach that we've taken from a systematic way. But you'll see getting back to FY17, that there's been really kind of a steady growth, and again, with the majority of our work being done in this synchronous type of capacity, and that is going to change a little bit.

I mean, there is being more and more at least of the asynchronous or the store and forward type of work, and more of the work with some of our services into the home itself. And, you know, this is kind of going back to the data, and I know that this slide may not show up particularly well. But one of the standardized outcomes that the VA does use is the International Outcome Inventory for Hearing Aids. And so as it currently

stands, there's been a little bit over a million of the IOIHA done or completed as our national hearing aid outcome. We do have the ability on that to designate whether that care was provided in a face-to-face type of a scenario, or at least in a virtual capacity.

And as things stand right now, the VA's completed, at least for teleaudiology, over 30,000 of those encounters. So much smaller proportion as it relates to some of our face-to-face care. But the exciting thing about it is, at least our outcome data has been as good, if not better than some of our traditional face-to-face encounters. And it's just been kind of one of the one tools or ways that we've gone through to systematically evaluate at least our services. We've been very careful on the education training resources, competency requirements, equipment configurations, and then how we brought that forward, at least for sites to be able to use. So very robust, very mature, but there's been a very systematic and evidence-based approach at every step of the juncture regardless of the technology that's been used, as we've moved ahead.

And it's shown from not only, you know, at least some of our outcomes, but also from some of our patient satisfaction scores and feedback. So this just gives you a little bit of an idea again as far as kind of some of the main equipment options that we're currently using. Again, the system to the right is a multidisciplinary cart that's used, and it's kind of a standard endpoint in most of our satellite or community-based outpatient clinics. And what we ended up doing is, since that was a used piece of equipment for at least our onsite hands, or kind of one of their primary tools itself, we had figured out on how we were integrating at least some of the audiology peripherals.

So generally, at least on the majority of the carts, we do have an audiometer, there's an immittance bridge, a hearing instrument test box, generally a video otoscope or a general examination camera, and then some type of verification or real ear unit that's there. So again, covering the majority of at least our bread and butter services. There are some that will offer, you know, at least otoacoustic emissions, or you know, other

pieces of peripheral equipment that could be placed on that cart. In addition to that, we've done a lot of work, and we'll kind of get into just a little bit of this in the store and forward telehealth realm. And this is really taking some images of both the external auditory canal, tympanic membrane, both the right and the left ear, a picture at least of the pinna for both ears.

And then taking an automated hearing test with masked ear and bone. There is close set speech that's available. But those objects are integrated at least into the health record. An audiologist is alerted of those results. They're able to review them, document at least in the note, do some type of a follow-up care. It could be a phone call, it could be a video visit to discuss the results, and really determine what treatment plan is the most appropriate at least for that individual. So the store and forward telehealth, that clinical pathway has taken us some time, but it really is kind of starting to evolve and about some really exciting opportunities where that technology lies. We've also done some different setups.

This was a wall mounted unit. I know that we had worked with one of the manufacturers as far as kind of having some storage, but again it had the same peripherals, video conferencing pieces, and variety of pieces of equipment itself. And you know, what we're seeing now, which is very exciting, is we're kind of reevaluating where the next phase for VA teleaudiology is kind of moving. Where do we kind of see ourselves going as far as enhancing the capabilities that we currently have? And really kind of changing or reducing the overall footprint itself. So really kind of exciting to see where we're at least moving with that direction. But these were kind of the three main options that we had for some of our standard clinical video telehealth types of equipment, as well as the store and forward model.

So this just gives you a little bit of a better idea. And you know, as I said in 2014 is when kind of this part, as far as the VA I2, or innovation competition that started. And

again, this automated testing was part of that system, and so it's Automated Audiometry Clinical Extender. I mean, we're using this both in a face-to-face as well as the telehealth setup. But for us, we're doing this in a synchronous type of a capacity. A nurse or an audiology assistant or a technician is there to set up a patient, and help them at least kind of move with a forehead placement of a bone oscillator as well as the headphones. In addition, they are taking some photographs itself of the ear to make sure that there isn't any medical contraindications, free of wax, pinna as far as a measuring tool.

These images can be annotated. And then they're going through and at least allowing the veteran to do a self-administered hearing test itself. Again, those items do get entered into electronic health record. They are forwarded to an audiologist that's kind of part of a reading group, so they are alerted. Generally there is at least an expectation of 48 to 72 hours, can vary a little bit from site to site, before they, you know, are able to read those results, and then at least contact the veteran and make any treatment recommendations for that. So again, this is, you know, over a 10 year period, really kind of seeing this pathway or at least the steps kind of come forth. And I know that Dr.

Tomasek's gonna kind of describe, you know, some of the other supporting documentation resources and work that's been done, at least on that front. The other piece that started off at least with that innovation was this enterprise remote tuning of hearing instruments. In the VA we, you know, as most know, or at least in the federal government, do love our acronyms. But this started off with one manufacturer, where we were looking at having the capability to, and it was audio only as far as the communication, but having a veteran with at least some type of an intermediary device, being able to go through and make some basic programming adjustments with that. And that's evolved. We've gotten quite a bit of feedback, at least through some of the piloting and trialing work, at least with our veteran population that really they wanted to see somebody.

So having that kind of embedded, you know, secure type of an audio visual capability, as well as reducing the requirements, and Bluetooth Low Energy has allowed us to communicate. So all a veteran really needs is their smartphone with a downloaded app, where there's a secure and encrypted at least connection that is being sent from the provider to that patient, where you're able to log in, see that individual, and make some basic programming or adjustments at least for those types of devices. And so this has been a great stop gap. It's been a great opportunity to just engage with veterans that maybe it would've been lost to follow up. And at least as we kind of started with one manufacturer, we've seen that everybody that we do have, there's five manufacturers on our national contract, all do have their solutions.

They've been vetted. There's been firewall modifications that have gone through to secure, at least that communication, and constantly looking at ways to improve at least the security that's there. So that has been a very exciting, and it's taken on multiple evolutions from when we first started with this innovation capability and where it kind of currently stands right now. This just kind of gives you a little bit of some background, if you're not familiar. I think maybe most are now. It's not, again, overly novel anymore, but we're pretty proud to be working at least hand in hand with at least the vendor community on bringing these solutions forward. But this just gives you a little bit of an idea as far as what the provider's gonna see, as well as the patient.

But it's an embedded audio video link into at least the programming software where you're making some basic adjustments, and then able to move outside of that. So I do wanna give a shout out. I mean, there's been a huge partnership, so this is not something that the VA's done on their own. Again, we have been working with a multitude of partners, whether it's been OINT, Health Technology Management, Office of Connected Care, telehealth services, rural health. But one of the other partnerships that's been very special, at least to us, has been the VA's partnership with the

Department of Defense, and specifically the Hearing Center of Excellence. And so this is a slide that I had taken from at least one of their presentations, but it just kind of gives you some idea as far as kind of some of the evaluation, the work.

But there is a boothless audiometry networking group that we've kind of coined as the BAN team. But there's been a lot of folks that have been evaluating kind of best in class or markets, documenting that, piloting, you know, determining what equipment is going to be the best served for, you know, different mission focuses itself. And so this just gives you a little bit of some background, and it's a little bit out of date. There's been some changes with some of the choices that are there. But you know, really kind of trying to take a look and fit at least the best technologies, the most mature, robust to at least the needs, and constantly reevaluating that process, and kind of taking a look as we kind of move forward.

So again, this just gives you a little bit of an idea. A lot of these, I think, you know, maybe folks are familiar, with others may not, but it is really kind of exciting to see that grow in how we systematically approach those technologies and determine what fits best for us. So this is another partnership too, as it relates, and this is accessing telehealth through local area stations or ATLAS. And this was a partnership, and it started about the same time as the Anywhere to Anywhere Initiative that kind of opened up where, and the locations and what we're able to provide services. But there were a partnership between Walmart, some of our veteran service organizations, the VFW, American Legion itself, of creating some space or utilizing their spaces to put kind of, at least just secure type of an area that was there with some of our video conferencing capabilities, to connect to a veteran.

And this was primarily focused on mental or behavioral health to start. Some basic primary care counseling services were also offered, but we're fortunate in this kind of next phase where audiology has been at least a part of that. So we do have a

partnership at use, at least with the Eureka Montana VA or American Legion that's there, or VFW, I'm sorry. In Eureka where there has been an opportunity to go in and to get some basic tinnitus counseling, remote programming, or some basic adjustments are being able to be provided, at least at that given location, where even to a remote clinic, there's still a considerable drive time, or a distance that needs to occur just to kind of to get to even some of these remote community-based outpatient clinics itself.

So this is really kind of exciting for us as we look to change really where we're at. I know that there's been some opportunities where we're looking to get on University of Montana, Montana State campuses itself, and then other locations that we're expanding to, as well as the types of services that we're able to offer. So as it stands right now, the majority of the peripheral devices are fairly limited as we kind of work through, you know, what can be actually accessed, served and what's kind of in alignment with some of the joint commission requirements itself. But as it stands right now, kind of the direct video conferencing, real synchronous types of activities that we currently do in audiology are being offered and will expand in the future.

And this just gives a little bit of some background too as far as kind of where we're looking, and what our footprint or, you know, really kind of our portfolio looks like. And I know right now we do have a concerted effort that's gone out with some of at least the pilot work as far as integrating tablets for doing an automated hearing test. It can be a live synchronous type of a test, and with our primary care and our home-based primary care teams, almost treating audiology like a vital sign or the same expectations. So there's been a lot of partnership, or at least support that we've gotten from the Office of Primary Care to look at integrating some of those.

We are looking at kind of expanding at least our automated audiometry portfolio, as well as some of our clinical video telehealth services as well. And I know that Dr. Tomasek is gonna get into this a little bit, but there's just been a tremendous amount of

work as far as the training resources, for at least all the roles and the expectations. She's really been at the forefront of that, and what we're doing at least within the VA. And then kind of looking at, you know, some of our other boothless options, as well as some of our virtual care aftercare, and seeing how that kind of expands or evolves with some time, so. But Dr. Tomasek, I am going to turn things over to you, if you're good with it, and look to kind of the close things out for us.

- Yes. Great, thank you. Well, good afternoon everyone. Thank you for hanging in there during this 90 minute presentation. For the third part of today's session, I'll be providing an overview for how VA audiology care is conducted through synchronous telehealth. All right, so as we heard earlier in the presentation, our synchronous telehealth is characterized by that real time virtual connection between the patient and the provider. This can be done in a clinic to clinic video telehealth format, where it's the main medical center to our satellite clinics or outpatient clinics, or it could be in the clinic to home telehealth environment, where it's the provider at a main medical center connecting to the patient from the comfort of their own home.

Within each of these modalities, there are different types of audiology services that we can provide, and there is a little bit of overlap. In clinic to clinic, we can provide hearing evaluations comprehensive in nature. Anything that we can do in the face-to-face clinic, we more than likely can do that through our clinic to clinic or video telehealth. We can also do hearing aid fitting and programming. We can do our cochlear implant programming, as well as vestibular rehabilitation, just to name a few of the modalities there, or services, excuse me. For our clinic to home telehealth, this can be done in both an individual setting or in a group setting. Services like oral rehabilitation, or tinnitus management, or as we've kind of shifted in our name for tinnitus management, it's living better with tinnitus.

And of course, the remote programming of hearing aids can be done in that clinic to home telehealth. For today's presentation though, we are gonna be focusing on the first with our synchronous clinic to clinic telehealth, the hearing evaluations, and the hearing aid fittings specifically. So to set the stage a little bit, we wanna kind of identify who is involved, what is involved, before we go through that clinical workflow. For clinic to clinic telehealth, the virtual care team is gonna consist of the telepresenter, which will be located at that originating site. Often it's that community-based outpatient clinic or satellite clinic where the patient and their family member is physically going to show up for their visit.

And then they are connecting to that remote location where the audiologist is at a parent facility or the main medical center, and that can be referred to as the remote site. The telepresenter at the patient site can be a nurse or a technician, and they'll be responsible for facilitating, excuse me, facilitating all types of telehealth services. So not just for teleaudiology. They may have multiple services within their clinical day, such as teledermatology, it could be teleprimary care, in addition to their teleaudiology workload. More often than not at the community-based outpatient clinics, it's reserved for primary care as the main focus, with maybe two to three specialties in addition to that. So within the VA, having our staff organization for teleaudiology, we rely heavily on this strong collaboration between our audiology service and the telehealth service lines.

This partnership is what allows us to reach patients for audiology that maybe couldn't make it into the main medical center, where a lot of our specialty care is housed. So, bringing it closer to the patient and where they are. Something that has come up as we've gone through this presentation is what type of training is involved. So we've seen kind of the intricacies of everything that may need to happen, and it begs the question, well, what kind of training does someone need to have to enter into this type

of a visit? And I guess the long and short of it is that there is training that is involved. So it is not something that you can just easily step into.

It is something that requires some hands-on, it requires some resources, some recruitment with working with a preceptor to go through your certification and your skills. We do try to have all of the necessary competencies completed as it relates to telehealth, and then from there we're able to layer in or add in the specialty type of training, such as teleaudiology. So for me it kind of helps to think of it as those two separate buckets. So we've got our telehealth bucket and we've got our specialty bucket. And so within telehealth, it really does encompass all of our hands-on training, the basic telehealth courses, such as emergency management procedures, and then going through all of the equipment and technology that's involved in that.

And then you are meeting with a preceptor to go through what all skills are necessary to conduct that visit. And then from there, we're able to layer in any other specialty. So looking at all of our audiology care, so the hands-on with what we would do in audiology, how to handle a hearing aid, you know, certainly some of the specifics on video otoscopy or just the telepresenting of the ears and what that will look like. With all of those things combined, we do have a lot of resources to support that, so online courses that have comprehension checks involved in them, so that it's interactive as they go along. And then at the end, there is a skill assessment that's conducted with a preceptor.

Basically just a trained or experienced person in this specialty that can walk through what that patient encounter will look like, and ensuring that they have all of the skills necessary to conduct the visit. And this is all done, you know, before you're ever seeing your first patient. So everyone feels like they have the familiarity and the resources available to provide care. All right, so the what. What equipment is needed or can be seen on both the provider side and the patient side? The equipment that's

needed to conduct an appointment on the provider side is actually quite minimal. In this example, it does show three screens, however, the recommendation is really just for those dual monitors when available, and could certainly be done on one monitor, although I will say two screens is the recommendation.

The provider just needs to have a private room, where they can converse with the patient in a, you know, a secure location. There's not a lot of people coming in and out of the room. And then of course, they're gonna need a camera to conduct the visit. A headset for the audio is recommended, especially with our patient population, those that are hearing impaired or hard of hearing. But in some cases, a provider headset may not be able to be used or possible, especially when you've got a student with you or you're in a precepting type of scenario. And so it may be more of a desktop microphone, where the room can be the patient's responses and communication could be heard through the room rather than the headset.

On the patient side, however, the equipment is a little bit more in depth, and this of course is because all of the test battery that we want to complete in a face-to-face setting, we want to be able to complete through telehealth. So we ensure that all the necessary tools are on hand for the provider to adequately assess the patient's audiological needs. The patient side equipment for the VA does consist of the telemedicine cart that you see here on the screen in front of you. The main components, of course, are our audio and video conferencing equipment. This is standard to the cart. As mentioned before, the cart is used for multi-disciplines, so it can be used for primary care or other specialties.

And so what we're gonna be focusing on is the audiology peripherals, so what needs to happen on that cart or what hardware is needed for us to conduct an audiology visit. And so that would be our audiometer, of course. In this image you can see that it's there on the bottom of the cart affixed under there. So you could really just see a very

small sliver. But that's where all the cords or all of our transducers are being plugged into it. The arm that's located on the left hand side where the speaker is, that is our speaker for verification and calibration purposes. And then we're gonna flip here to see on the backside of the cart where we have the immittance bridge for tympanometry and acoustic reflexes.

That's that white box that's right there in the center spine of the cart. And then of course, we've got the long enough cord where it can be seated on the patient's shoulders in front of the cart. On the top, you can also see the hearing aid test box, that's that blue larger box toward the top. And that's where we can use for any of our electroacoustic analysis that's maybe done before the patient is there, but it also allows us to do our RECD measurements. And then there in the center of the spine as well, right below the immittance bridge, you can have the option of adding in otoacoustic emissions, if that is part of your test battery as well.

All right, so now that we have been introduced to kind of the virtual care team, the who is involved and the equipment or what hardware is needed, I just wanna take a look at the clinical pathway. And we're first gonna start with the workflow as it relates to a hearing evaluation, or as we sometimes refer to that as remote diagnostics. Remote diagnostics can be completed in both a sound booth or in a boothless environment, so sans the sound booth. Open room testing within the VA is what's being done in the majority of settings. It's not a new scenario for audiology, being able to test someone outside of the sound booth. However, there are some special considerations that we'll walk through here in just a moment, ensuring that we do have the environment within our ANSI standards for audiometry, since we don't have that sound booth or sound treated enclosure to assist with that.

So as I mentioned, when possible, the following things should be carefully considered when we're talking about boothless testing on the patient side, looking into the location

of where the boothless audiometric testing will be conducted, what the noise criteria of the room will be, if there's any considerations for the wall surfaces or the floor surfaces. We wanna choose a room that perhaps is not in a high patient traffic area. So we don't want people coming and going, or, you know, having the hall noise. Certainly anything that that can be accommodated is best or ideal. We also recognize that in a lot of cases, particularly in the VA, we're not planning the space ahead of time. So we can't ideally say I want to secure a room that's 10 by 10, so that everyone can be comfortable.

We want to plan things kind of from the ground up. But we oftentimes are coming into a place that's already established. And so just be cognizant of what those characteristics of the room are, and seeing if there are ways that the room can be modified or adapted to ensure that we are doing what we can physically to make that room ideal for an acoustic environment in our open room testing. And some of the ways that you can do that, and in fact is a high recommendation, would be to complete a noise survey. So once the room is selected or where is kind of intended, then we do have this noise survey for our maximum permissible ambient noise levels to be measured throughout the course of the day.

This can be conducted by a VA industrial hygienist, or anyone really as a third party professional that can come in and do that noise survey. And they're gonna give you those measurements of octave band intervals to ensure that you are meeting those ANSI specifications that we know all too well, so that you are able to make that informed decision on where the location for testing will be. So as we move into the how to or the workflow of the hearing evaluation, it really does start with the pre-encounter or what's required of the telepresenter in preparing the environment. These can include a listening check or a biological check. So putting the transducers on, making sure that they have a loud and audible signal from the audiometer, free of distortion.

It could be taking an inventory of all the supplies that are necessary for that visit, or the visits of the day. And it could also include a probe check of the tympanometry probe, making sure that it's well calibrated, or if there's any checks that need to be done to ensure that it's ready. And then of course we begin the encounter when the patient is brought back into the room. So we see that the telepresenter is able to establish our video connection. They introduce all parties into that appointment, and that's when the screen sharing capabilities or the ability for the provider to actually remote in and control all of that hardware that's on the patient's side to conduct the hearing evaluation.

Although the provider is remoting in to take control, there really is that reliance on the technician or the telepresenter to be our hands, to be our eyes, to be our ears, to relay all that information since we are not there at the site with the patient. So having all the tools to be able to bring the camera closer, to be able to listen in on things that maybe need to be repeated, and certainly to place the equipment and do things that we can't physically do when we're not there. We start the encounter with video otoscopy. And I did put in just kind of an image to show you just the real high resolution that we're working with when we conduct video otoscopy.

As I mentioned, we're not there, and so being able to have kind of that very sound quality of images, so that we know that we're making the appropriate diagnosis and assessment for the patient's audiological needs is really great to be able to see that come through. In some cases, there may be cerumen management that's warranted, and in those cases, we handle those based on the clinical protocol within that facility, and it can vary from site to site, more so because of the scope of practice for the telepresenter that we're working with. And I think it was mentioned earlier, but sometimes these telepresenters are technicians. Sometimes their background is in audiology. Sometimes these are nurses, and certainly being a nurse, that might be something that's part of their everyday activities, regardless of the teleaudiology.

So it makes it a little bit more streamlined, and in other cases, it is a separate visit, or it's attached to the visit either before. So in addition to that one time noise survey, or maybe that noise survey that's done on an annual basis or as the room maybe undergoes some changes, we always ensure that we're doing a noise assessment during the patient visit. So the use of a collar that's placed on the patient's shoulders, has the microphone open and assessing the environment throughout the patient appointment. And then the provider is also able to place the transducers of choice while that microphone is around their shoulders as well. This is just a look at what the hearing evaluation may look like as you control the screen of the audiometer, the PC audiometer on the other side.

You'll see here at the bottom where it does depict kind of those green and orange bars is where it's showing you what the noise is in the environment during testing. And as we know, the transducer that's selected, the frequency that we're testing, these are all gonna have an impact on what we're seeing as far as the noise assessment. So understanding what that trade-off is, and what we're gonna be looking for. It is uncommon for the noise in the room to detrimentally affect these thresholds as long as we've done very careful planning for the room and location where we're gonna be at. However there are checks and balances in place, so that when we do see that, we can appropriately adjust for that and qualify that in how we counsel the patient and provide care.

Something that we always want to be implementing is this standard of care that would be the same as we would do in a face-to-face environment. And within the VA, we have a field advisory council that has published some of our clinical best practice recommendations. And so not only in our face-to-face environments, but also through telehealth, we wanna adhere to those practice recommendations. So ensuring that we are completing the entire test battery to include speech and noise testing, making sure

that we are monitoring the environment for any potential noise impact on the test, if we are outside of a sound booth. And I think this is also a great representation of kind of what it looks like from the provider side.

So having those two screens where you're able to see the patient on one side, and you're controlling the equipment on the other really kind of gives you that perspective. Certainly once the hearing test is complete, you're then able to have that real-time video connection continue, talking with the patient about what their goals are, if that's hearing aid selection, if that's counseling on the process. We do also have the ability to screen share. So just as we're, you know, doing today, if there's any educational information to share with the patient, that's something that can be done through that virtual means. Something that does get asked as well is what about ear mold impressions? So if you get to the point of hearing aid selection, how is that going to be part of the plan?

And again, that does depend on the scope of practice and the position description of the telepresenter that you're working with, and so there can be some variability in that. But we do see far more often than not that we're able to obtain that as a part of the complete visit. One other thing worth mentioning is our web-based audiology software. This is a little bit of a different equipment, well, it is a different equipment setup. It has a different footprint, it's by a different manufacturer. And it is something that we are using at a few pilot sites within the VA. So it is still within that synchronous realm. It has noise monitoring capabilities, it has the video otoscope, and it also has the transducers that come with it.

But instead of needing the hardware or the audiometer physically present at the patient site, it's a web-based audiology software. So I think that that's worth mentioning. Certainly within the VA, we are always looking for emerging technologies and ways to expand our services. We don't wanna be static, as certainly in a field of teleaudiology

where there is more and more things that are coming available, as we've seen a great representation of where we've come and all of the ways that we potentially can move forward in. All right, so now for the hearing aid fitting portion. Just wanted to walk through the clinical workflow on that, and how we conduct our hearing aid programming and verification measures.

It does start with that pre-encounter. So, being able to calibrate our reference microphone and our speakers, ensuring that we've got the supply that's needed to conduct the visit. Certainly for a hearing aid fitting, there can be a lot more supplies involved. So making sure that you have a well defined process for inventory, and making sure that all of the different manufacturers are represented, so that you have everything that you need on hand. And then certainly the hearing aid programming connections. So whatever needs to be done to facilitate the appointment, charging things, making sure that everything is ready for the visits of the day. Once the patient is brought back into the room, the same applies where we're able to conduct video otoscopy, and then also being able to prepare the patient for our verification measures.

As we've seen earlier, there is quite a bit of training that's involved, particularly as it relates to hearing aid fittings, we would see that in probe tube placements. So we're not gonna get great measurements if we don't have an accurate placement, and so a lot of time is spent making sure that the telepresenter feels comfortable with that, that it's something that also the provider feels comfortable in that communication with the telepresenter. We can use the general exam camera as well. So rather than the very focused view with the otoscope, we have the option of changing out the head, so that it's a larger or macro view. So you could see the placement of the entire transducer for the hearing test or the bone oscillator, or specifically how the hearing aid is sitting, or that probe tube is placed in the patient's ear.

In addition to that, the software often will have a feature where there's an assistant, so you can double check the placement of the probe tube, so being able to see that before proceeding with your real ear or verification measures. As mentioned, we do wanna adhere to performing those same procedures that we would do in a face-to-face environment, and within the VA, one of those practice recommendations, of course, is for not only real ear but also our RECD, or real ear to coupler difference, accounting for that conversion of our SPL in the hearing aid fitting prescription targets from what was done on the audiogram and DBHL. All right, so throughout the hearing aid fitting appointment, I will say the role of the telepresenter is vital for our telehealth encounters.

We rely on their ability to effectively communicate, to be able to follow instruction, and working through any troubleshooting that may be needed, or really just to describe the tasks at hand. The knowledge of these telepresenters, I can't say enough about how much we are appreciative of the work that they do. They are the hands and the eyes of the provider. So their knowledge and comfort with the technology is so important. It goes a long way in ensuring that we have a smooth encounter. With the technology and connectivity and troubleshooting, we know we're gonna encounter it. We know that we encounter it in a face-to-face environment, and so that much more so in a telehealth modality, where we are relying on technology.

But I think the key is really just to remain adaptable. So having that strong communication with your telepresenter and the provider, working through things together. I will say that some of the outstanding qualities of a telepresenter would be someone that has that team mentality, so working together to achieve that common goal, and also to have that adaptability. So remaining professional while working through some of these problem solving really can be the key to success as you navigate it with the patient there, making sure that they feel comfortable, and they feel well cared for, and that they have complete confidence in you and trust of the system,

so. And it's a great experience overall. So I've gotta say, we always hear just wonderful satisfaction from patients, and we've shown that throughout the data.

All right, so this is really just after the encounter, how we do the follow-up. And I think the follow-up or the plan of care is important in how we manage these patients when they're seen through teleaudiology. And that can look different, depending on the type of setting or facility where they're being seen. And lastly, I just wanna go through kind of the ways that we are really building all of the pieces together to ensure that we have opportunities for everyone to be telehealth ready, improving our access to teleaudiology, and we do that in a variety of ways. So whether that's teleaudiology education and training, so the coursework that's there for telepresenters and providers, and supporting them.

We also have a teleaudiology advisory team. So it's a field of subject matter experts that are doing this day in and day out. They can have that peer-to-peer mentor support. We also house national biweekly calls for everyone conducting telehealth within the VA space, and office hours where they can bring any questions or concerns. And then last but certainly not least, we have resources that are available online for anyone, whether it's manuals, whether it's, you know, we did talk about the education and training, but all of those kind of Q&A or quick guides, operation manuals that are also available for everyone. All right. I know that we're at perhaps time, but I just wanted to kind of quickly summarize, and then we'll turn it over to see if there are any questions.

We have seen throughout the progression of today's session that telehealth is not a novel service delivery model. And in fact, I think Dr. Worthington did a great job of showing us that our history runs deep with telehealth, back since the Civil War. So most notably telehealth within the VA has started around 2003, so you know, just over 20 years. Being able to learn and understand kind of where we have come from, it's

really given us a great perspective to see how much we've really changed and progressed over the years to provide telehealth and audiology through this service. And then lastly, we looked at the clinical pathway and how that's perhaps not always been as smooth and well-defined as the pathway that I showed you today, but it really has come a long way over the years.

It's got a lot of foundation, and it really just allows us to focus on the patient and meeting them where their needs are, so meeting the patient where they are. In the VA, we always look to the emerging technologies and ways that we can advance and change with the times, so to speak. And so in the VA, we just really have that encompassing embrace through change, and how it can bring us closer to meeting the needs of our veteran patients. All right. So I wanna say thank you so much for your time and attendance today. We also wanna thank the Association of VA Audiologists and Audiology Online for their partnership, and our opportunity to present on today's forum.

So thank you so much.

- [Host] Thank you, Rachel. We have just one question in the queue here. We have one from Kevin here, and Kevin asked, "As a CNP provider, how can I find out more about the living better with tinnitus program that is offered through the VA?"

- So I can kind of start, and then Chad and Darrin certainly, if there's more to add. My recommendation would be to reach out to NCRAR within the VA. They have a lot of materials on that and kind of where that progressive tinnitus management has changed over the years.

- But to Rachel's point, NCRAR does have, at least within our kind of on demand training, various modules that are there for anybody that's going through that. They also have the paper resources as well, at least on their website.

- [Host] Wonderful. Thank you for your question, Kevin. Rachel, if you still have control of the slides, can you advance to the very last slide? Just to let everyone know that there is an exam at the end if they still wish to earn the continuing education. That generally populates, you know, 10 or so minutes after we conclude here and close the classroom. But I'd like to thank all of our presenters today, as well as AVAA for coordinating this series. It's a great series. And it's not just resources for those within the VA system, but also clinicians, you know, working with veterans outside of that system. So we wanna thank you all again, and we hope that you tune into the next AVAA courses later on this year.

Have a great day everyone.